

The Effectiveness of an Occupational Therapy Metacognitive-Functional Intervention for the Improvement of Human Risk Factors of Bus Drivers

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Abstract : Background: Many studies have assessed and identified the risk factors of safe driving, but there is relatively little research-based evidence concerning the ability to improve the driving skills of drivers in general and in particular of bus drivers, who are defined as a population at risk. Accidents involving bus drivers can endanger dozens of passengers and cause high direct and indirect damages. Objective: To examine the effectiveness of a metacognitive-functional intervention program for the reduction of risk factors among professional drivers relative to a control group. Methods: The study examined 77 bus drivers working for a large public company in the center of the country, aged 27-69. Twenty-one drivers continued to the intervention stage; four of them dropped out before the end of the intervention. The intervention program we developed was based on previous driving models and the guiding occupational therapy practice framework model in Israel, while adjusting the model to the professional driving in public transportation and its particular risk factors. Treatment focused on raising awareness to safe driving risk factors identified at prescreening (ergonomic, perceptual-cognitive and on-road driving data), with reference to the difficulties that the driver raises and providing coping strategies. The intervention has been customized for each driver and included three sessions of two hours. The effectiveness of the intervention was tested using objective measures: In-Vehicle Data Recorders (IVDR) for monitoring natural driving data, traffic accident data before and after the intervention, and subjective measures (occupational performance questionnaire for bus drivers). Results: Statistical analysis found a significant difference between the degree of change in the rate of IVDR perilous events ($t(17)=2.14$, $p=0.046$), before and after the intervention. There was significant difference in the number of accidents per year before and after the intervention in the intervention group ($t(17)=2.11$, $p=0.05$), but no significant change in the control group. Subjective ratings of the level of performance and of satisfaction with performance improved in all areas tested following the intervention. The change in the 'human factors/person' field, was significant (performance : $t=-2.30$, $p=0.04$; satisfaction with performance : $t=-3.18$, $p=0.009$). The change in the 'driving occupation/tasks' field, was not significant but showed a tendency toward significance ($t=-1.94$, $p=0.07$). No significant differences were found in driving environment-related variables. Conclusions: The metacognitive-functional intervention significantly improved the objective and subjective measures of safety of bus drivers' driving. These novel results highlight the potential contribution of occupational therapists, using metacognitive functional treatment, to preventing car accidents among the healthy drivers population and improving the well-being of these drivers. This study also enables familiarity with advanced technologies of IVDR systems and enriches the knowledge of occupational therapists in regards to using a wide variety of driving assessment tools and making the best practice decisions.

Keywords : bus drivers, IVDR, human risk factors, metacognitive-functional intervention

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